

REMARKS/ARGUMENTS

Favorable reconsideration of this application, in light of the present amendment and following discussion, is respectfully requested.

Claims 1-51 are pending. Claims 16-31 and 43-51 are withdrawn. By this amendment, the Abstract, specification, and Claims 1-33 are amended, and Claims 34-51 are newly added. Support for the amendments to the Abstract, specification, and Claims 1-6, 8-31, and 33 is self-evident. Support for the amendment to Claim 7 may be found in the specification, as published, at least at paragraphs [0041]-[0044]. Support for the amendment to Claim 32 may be found in original Claim 1, for example. Support for newly added Claims 34-51 may be found in Claims 3, 6, 8, 9, 11-15, 18, 20, 21, 23-27, and 31, respectively, for example. No new matter is added.

In the outstanding Office Action, the Abstract is objected to; Claims 6-15 and 32 are objected to as multiple dependent claims in improper form; Claims 1-5 are rejected under 35 U.S.C. § 112, second paragraph, as indefinite; Claims 1-5 are rejected under 35 U.S.C. § 102(b) as anticipated by Woodruff et al. (U.S. Pat. No. 6,353,501, hereinafter “Woodruff”); Claims 1 and 3-5 are rejected under 35 U.S.C. § 102(b) as anticipated by Tachibana et al. (WO 00/40402, hereinafter “Tachibana”); Claims 4 and 5 are rejected under 35 U.S.C. § 103(a) as obvious over Woodruff; and Claim 2 is rejected under 35 U.S.C. § 103(a) as obvious over Tachibana.

Regarding the objection to the Abstract, as suggested in the outstanding Office Action, the Abstract is amended to delete “Figure for the Abstract: no figure.” Accordingly, Applicants respectfully suggest that the objection to the Abstract is overcome.

Regarding the objection to Claims 6-15 and 32, these claims are amended to remove improper multiple dependencies. Thus, the objection to these claims is overcome and it is respectfully requested these claims be considered on the merits.

Regarding the rejections of Claims 1-5 as indefinite, it is noted that Claim 1 is amended to recite “a transparent substrate comprising glass” and Claim 3 is amended to remove the feature “and in that when it is associated with at least one other substrate to form a glazing assembly, this glazing assembly has a selectivity  $\geq 2$ .” Instead, this feature is incorporated into amended Claim 32 which recites a glazing assembly. Further, Claims 2-5 are amended to replace “it” with “the transparent substrate.” Thus, it is respectfully submitted that the rejections under 35 U.S.C. § 112, second paragraph, are overcome, and it is respectfully requested that the rejections of Claims 1-5 be withdrawn.

Regarding the rejection of Claims 1-5 as anticipated by Woodruff, that rejection is respectfully traversed by the present response.

Amended independent Claim 1 recites:

A transparent substrate comprising glass and provided with a thin-film stack including a plurality of functional layers, the thin-film stack comprising:  
at least **three silver-based functional layers**,  
wherein the thin-film stack has a **resistance  $R < 1.5 \Omega$**  per square and the transparent substrate is **transformable via a heat treatment at a temperature of at least 500°C**.

Accordingly, the thin film stack comprises at least three silver-based functional layers. Further, the thin film stack has a resistance  $R < 1.5 \Omega$  per square and the transparent substrate is transformable via a heat treatment at a temperature of at least 500°C.

With the stack of thin layers recited in Claim 1, it is possible to carry out various stacks with one or several specific application(s), with a composition of the stack remaining generally identical overall. Thus, only a few hours are needed to modify the product line and to pass from manufacturing a product having one or more preferred applications to manufacturing another product having one or more other preferred applications.<sup>1</sup>

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<sup>1</sup> Specification, as published, at paragraph [0030].

As a preliminary matter, it is noted that Claim 1 no longer recites that “said substrate may undergo at least one transformation” and is rewritten to recite “the transparent substrate is transformable via a heat treatment at a temperature of at least 500°C.” Thus, the argument asserted in the outstanding Office Action that this feature would be optionally present is negated and it is respectfully requested that this feature be given patentable weight.

Turning to the cited reference, the outstanding Office Action acknowledges that Woodruff fails to disclose a transparent substrate that is transformable via a heat treatment at a temperature of at least 500°C. Instead, the Office Action asserts that the article of Woodruff is considered to be capable of undergoing at least one transformation operation given that it meets the structural limitations of Claim 1.<sup>2</sup>

Applicants note that “[t]he fact that a certain result or characteristic may occur or be present in the prior art is **not sufficient** to establish the inherency of that result or characteristic.” MPEP § 2112, In re Rijckaert, 9 F.3d 1531, 1534, 28 U.S.P.Q.2d 1955, 1957 (Fed. Cir. 1993) (emphasis added). Moreover:

to establish inherency, the extrinsic evidence “**must make clear that the missing descriptive matter is necessarily present** in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, **may not be established by probabilities or possibilities**. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.”

In re Robertson, 169 F.3d 743, 745, 49 U.S.P.Q.2d 1949, 1950-51 (Fed. Cir. 1999).

Accordingly, as set forth in MPEP § 2112, “in relying upon the theory of inherency, the Examiner **must** provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic **necessarily** flows from the teachings of the applied prior art.” (emphasis added). Ex party Levy, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Inter. 1990).

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<sup>2</sup> Office Action at page 4, lines 18-19.

In this case, the outstanding Office Action asserts that Woodruff meets the structural limitations of Claim 1. Applicants respectfully disagree. As noted in the specification, slight variations in composition, order, and thickness of a film stack can vastly affect the properties of a film stack. For example, paragraphs [0015]-[0018] of the specification, as published, describe a film stack which, because of the thickness ranges required, cannot be used to produce a heated window or an electromagnetically shielded window.<sup>3</sup> Further, paragraphs [0020]-[0022] describe a film stack which may withstand heat treatment but which fails to have the acceptable optical characteristics such as transmittance, resistance, and color.

Similar to the above examples, Woodruff describes a film with dielectric layers that are much thicker than those recited in the claims of the present application. Specifically, the inner dielectric layers are of a thickness of between 50 nm and 90 nm and the outer dielectric layers are of a thickness between 20 nm and 50 nm. In contrast, the dielectric thicknesses described in non-limiting embodiments of the present application range between 5 and 15 nm and the inner and outer dielectric layers are described as relatively uniform in thickness. Furthermore, Woodruff fails to even disclose using the same dielectric material as described in non-limiting embodiments of the present application, specifically, one based on Zinc Oxide and dopeable with Aluminum. Instead, Woodruff describes a preference toward using niobium pentoxide and additionally mentions titanium oxide and tin oxide.

Thus, similar properties described in Woodruff do not inherently provide a transparent substrate which is transformable via a heat treatment at a temperature of at least 500°C. This feature **must necessarily flow** from the teachings of the cited reference in order for the above-noted assertion made on page 4 of the outstanding Office Action to support a rejection of Claim 1. The assertion in the outstanding Office Action that Woodruff meets the structural limitations of Claim 1 provides no basis in fact and/or technical reasoning to reasonably

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<sup>3</sup> Specification, as published, at paragraphs [0014]-[0018].

support the determination that the transparent substrate which is transformable via a heat treatment at a temperature of at least 500°C necessarily flows from Woodruff.

Therefore, in light of the large number of variables affecting the properties and characteristics of a film stack and given that these properties are not necessarily present in Woodruff, Applicants respectfully submit that Woodruff **does not inherently disclose** a transparent substrate which is transformable via a heat treatment at a temperature of at least 500°C.

Accordingly, Applicants respectfully submit that amended independent Claim 1, and all claims depending therefrom, patentably define over Woodruff. Therefore, Applicants respectfully request the rejection of Claims 1-5 under 35 U.S.C. § 102(b) be withdrawn.

Regarding the rejection of Claims 1 and 3-5 as anticipated by Tachibana, that rejection is respectfully traversed by the present response.

Tachibana fails to disclose a thin-film stack comprising “at least three silver-based functional layers, wherein the thin-film stack has a resistance  $R < 1.5 \Omega$  per square and the transparent substrate is transformable via a heat treatment at a temperature of at least 500°C,” as recited in Claim 1. Specifically, Table 9 of Tachibana describes a thin-film stack with **four** Ag-1 based layers, **not three**. Further, Table 7 and paragraph [0061] of Tachibana describe a thin-film stack with three Ag-1 based layers where the sheet resistance value **equals**  $1.5 \Omega$  per square, and **not** a resistance value **less than**  $1.5 \Omega$  per square. Thus, Tachibana fails to disclose “at least three silver-based functional layers, wherein the thin-film stack has a resistance  $R < 1.5 \Omega$  per square.”

Regarding the clause, “the transparent substrate is transformable via a heat treatment at a temperature of at least 500°C,” as recited in Claim 1, the outstanding Office Action acknowledges that Tachibana fails to disclose this feature. Instead, similar to Woodruff, the

Office Action asserts that the article of Tachibana is considered to be capable of undergoing at least one transformation operation given that it meets the structural limitations of Claim 1.<sup>4</sup>

As discussed above regarding Woodruff, in relying upon the theory of inherency, the Examiner **must** provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic **necessarily** flows from the teachings of the applied prior art.

In this case, a transparent substrate which is transformable via a heat treatment at a temperature of at least 500°C does not necessarily flow from the film-stacks described in Tachibana. Specifically, as described in Tables 1-9, Tachibana only uses Titanium oxide as the dielectric layer<sup>5</sup> where, in non-limiting embodiments of the present application, a Titanium-based layer is used as an absorbent metal layer and ZnO is used as the dielectric layer. Thus, Tachibana fails to disclose an absorbent metal layer, such as Titanium-based layer, **and** a dielectric layer, such as ZnO. As a result, the composition of the thin-film stacks in Tachibana are not the same as the thin-film stacks described in non-limiting embodiments of the present application, and thus, it **does not necessarily flow** that a transparent substrate including the thin-film stacks in Tachibana is transformable via a heat treatment at a temperature of at least 500°C.

Furthermore, the outstanding Office Action provides no additional basis in fact and/or technical reasoning to reasonably support the determination that the transparent substrate which is transformable via a heat treatment at a temperature of at least 500°C necessarily flows from Tachibana.

Therefore, Tachibana fails to disclose a thin-film stack comprising “at least three silver-based functional layers, wherein the thin-film stack has a resistance  $R < 1.5 \Omega$  per

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<sup>4</sup> Office Action at page 5, lines 18-20.

<sup>5</sup> Tachibana at paragraph [0010].

square and the transparent substrate is transformable via a heat treatment at a temperature of at least 500°C,” as recited in Claim 1. Moreover, since both Woodruff and Tachibana fail to disclose “the transparent substrate is transformable via a heat treatment at a temperature of at least 500°C,” no proper combination of these references would set forth each and every element of Claim 1.

Accordingly, Applicants respectfully submit that amended independent Claim 1, and all claims depending therefrom, patentably define over Tachibana, and respectfully request the rejection of Claims 1 and 3-5 under 35 U.S.C. § 102(b) be withdrawn.

Regarding the rejections of Claims 4 and 5 as obvious over Woodruff, those rejections are respectfully traversed by the present response.

Amended dependent Claims 4 and 5 depend from amended independent Claim 1 and are patentable for at least this reason. Further, regarding Claim 5, it would not have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the number of silver-based layers from two to four.<sup>6</sup> As described in the MPEP, only result-effective variables can be optimized. MPEP § 2144.05(ii)(B) states:

A particular parameter **must first be recognized as a result-effective variable**, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977).

Woodruff does not describe a thin-film stack including at least four silver-based functional layers. Moreover, Woodruff discourages using additional or thicker conductive layers since doing so lowers the transmission of visible light. Thus, the description of Woodruff to use two or more, and preferably three, conductive layers of limited thickness is insufficient to set forth the effect of using at least four silver-based functional layers, since it

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<sup>6</sup> Office Action at page 7, lines 6-8.

is unclear what result would be achieved. Accordingly, Applicants respectfully request that the thin-film stack including at least four silver-based functional layers in amended Claim 5 be given patentable weight. Applicants further respectfully submit that Woodruff is devoid of any teaching of the thin-film stack recited in amended Claim 5, and amended Claim 5 patentably distinguishes over Woodruff for at least this reason.

Regarding the rejection of Claim 2 as obvious over Tachibana, that rejection is respectfully traversed by the present response.

Amended dependent Claim 2 depends from amended independent Claim 1 and is patentable for at least this reason. Additionally, Tachibana teaches away from the features recited in Claim 2. Specifically, Tachibana states:

In a constitution wherein titanium oxide layers and metal layers are alternately laminated, when the number of lamination is increased, the wavelength width in which a low reflectance can be obtained in the visible light region will increase. However, it was confirmed that **the tendency of decrease in transmittance becomes significant along with increase in the number of lamination**, more than expected from optical interference effect.<sup>7</sup>

Thus, an increase in the number of laminated metal layers is directly proportional to a decrease in transmittance. Tachibana further reinforces this conclusion when describing the following transmittance values for embodiments which include between 2 and 4 silver-based layers:

Number of metal layers	Transmittance
2 silver-based layers	72%
3 silver-based layers	64%
4 silver-based layers	44%

**Table 1: Silver-based layer embodiments of Tachibana**

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<sup>7</sup> Tachibana at paragraph [0050].



As shown in Table 1 above, the 2 silver-based layer embodiment in Table 4 of Tachibana describes a visible light transmittance around 72%, the 3 silver-based layer embodiment in Table 7 of Tachibana describes a visible light transmittance around 64%, and the 4-layer silver-based embodiment in Table 9 of Tachibana describes a visible light transmittance around 44%.

Therefore, since the 3 silver-based layer embodiment of Tachibana is limited to 64%, and since Tachibana describes the transmittance value as decreasing with the inclusion of each additional laminated metal layer, a person having ordinary skill in art reading Tachibana would be discouraged from using Tachibana to achieve the transparent substrate provided with at least three silver-based layers, as recited in Claim 1, wherein the transparent substrate has a light transmission  $T_L \geq 70\%$ , as recited in Claim 2.


Accordingly, since Tachibana teaches away from the features recited in dependent Claim 2, Applicants respectfully submit that Claim 2 patentably defines over Tachibana and respectfully request that the rejection of Claim 2 be withdrawn for at least this additional reason.

Regarding newly added dependent Claims 34-51, Claims 34-42 depend from independent Claims 1 and 32, and thus are believed to be drawn to the elected invention. Further, Claims 43-51 depend from independent Claim 16, and thus are believed to be drawn to the non-elected invention. It is also respectfully submitted that these claims are allowable at least by virtue of their dependency.

Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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